

THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE PROPERTY OR PRIVILEGE IS CONTAINED IS CLAIMED ARE DEFINED AS FOLLOWS:

1. An apparatus for the ultrasonic treatment of a ~~microbiology~~ contaminated liquid comprising, a module having a treatment container and an ultrasonic generating means for subjecting ultrasonic vibrations on liquid in the container whereby contaminated liquid in the container subjected to the ultrasonic vibrations result in cavitation in that liquid and
10 the destruction of microorganisms contained therein, the ultrasonic generating means being located outside of the container and submerged in a transmission fluid which contacts an outside surface of the container and the apparatus having a pressurization means for the transmission fluid in order to pressurize the transmission fluid and prevent cavitation occurring at areas surrounding the ultrasonic generating means.
2. An apparatus as defined in Claim 1, wherein the treatment container is a pipe through which the liquid can
20 continuously flow and the ultrasonic vibration generating means is at least one piezoelectric ceramic ring surrounding the pipe.
3. ~~An apparatus as defined in Claim 2, wherein a number of ceramic rings are co-axial with the pipe, each ring being located adjacent to another ring.~~
- Sub A1

4. An apparatus as defined in Claim 3, wherein the transmission fluid is an oil.

5. An apparatus as defined in Claim 4, wherein a number of modules are connected in parallel with inputs to each of said pipes being connected to an input manifold and outputs of each pipe being connected to an output manifold to form a bank of modules.

10 6. An apparatus as defined in Claim 4, wherein the pipe is stainless steel and extends through an outer container that has a fill hole for the oil and an air vent to vent air from the container as it is filled with the oil and means to seal the air vent once the container is filled with oil.

7. An apparatus as defined in Claim 6, wherein the ceramic rings are fixed in the outer container by a support attached to the outer container.

8. ~~An apparatus as defined in Claim 6, wherein the transmission fluid is pressurized by a hydraulic cylinder connected to the outer container's interior, the cylinder being provided with means to apply a predetermined pressure to a piston in the hydraulic cylinder.~~

9. An apparatus as defined in Claim 8, wherein a number of modules are connected in parallel with inputs to each of said

pipes being connected to an input manifold and outputs of each pipe being connected to an output manifold to form a bank of modules wherein transmission fluid in the modules is pressurized by a single hydraulic cylinder connected to all of the outer containers, the cylinder being provided with means to apply a predetermined pressure to a piston in the hydraulic cylinder.

10. An apparatus as defined in Claim 10, wherein an equal number of modules are provided on each side of a central support structure.

11. An apparatus for the ultrasonic treatment of a microbiology contaminated liquid comprising, a module having a treatment container and an ultrasonic vibration generator for subjecting liquid in the container to ultrasonic vibrations in a frequency range of 22 kHz to 40 kHz whereby contaminated liquid in the container subjected to the ultrasonic vibrations results in cavitation in the liquid and the destruction of microorganisms contained therein, the ultrasonic vibration generator being located outside of the treatment container and submerged in a transmission fluid which contacts the outside of the container, the fluid being pressurized to prevent cavitation occurring at areas surrounding the ultrasonic vibration generator and filling a chamber that surrounds areas around the treatment container.

12. An apparatus for the ultrasonic treatment of a microbiology contaminated liquid as defined in Claim 11, wherein the transmission fluid is pressurized by a hydraulic cylinder connected to the chamber's interior, a piston in the hydraulic cylinder being connected to equipment that maintains a predetermined pressure on the piston.

10 13. An apparatus as defined in Claim 12, wherein the treatment container is a pipe through which the liquid can flow and the ultrasonic vibration generator are piezoelectric ceramic rings connected to a power supply, the pipe extending through the rings' center.

14. An apparatus as defined in Claim 13, wherein the transmission fluid is an oil.

15. An apparatus as defined in Claim 14, wherein a number of modules are connected in parallel with inputs to each of said pipes being connected to an input manifold and outputs of each
20 pipe being connected to an output manifold to form a bank of modules.

16. An apparatus as defined in Claim 14, wherein the pipe extends through a central portion of said chamber which has a fill hole for the oil and an air vent to vent air from the chamber as it is filled with the oil, a seal being located on

the air vent which can be operated to close that vent once the chamber is filled with the oil.

17. An apparatus as defined in Claim 16, wherein a number of modules are connected in parallel with inputs to each of said pipes being connected to an input manifold and outputs of each pipe being connected to an output manifold to form a bank of modules.

10
18. An apparatus as defined in Claim 16, wherein a number of modules are connected in parallel with inputs to each of said pipes being connected to an input manifold and outputs of each pipe being connected to an output manifold to form a bank of modules wherein transmission fluid in the modules is pressurized by a single hydraulic cylinder connected to all of the chambers, the cylinder being provided with means to apply a predetermined pressure to a piston in the hydraulic cylinder.

19. An apparatus as defined in Claim 18, wherein an equal
20 number of modules are provided on each side of a central support structure.

20. An apparatus as defined in Claim 19, wherein the rings are fixed in the chamber by a support structure attached to one of the chamber's walls.